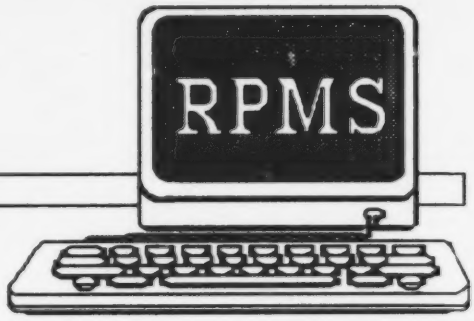
27/2



Indian Health Service manuals for RPMS system users

Patient Care Component

ICD CODING SUBSYSTEM

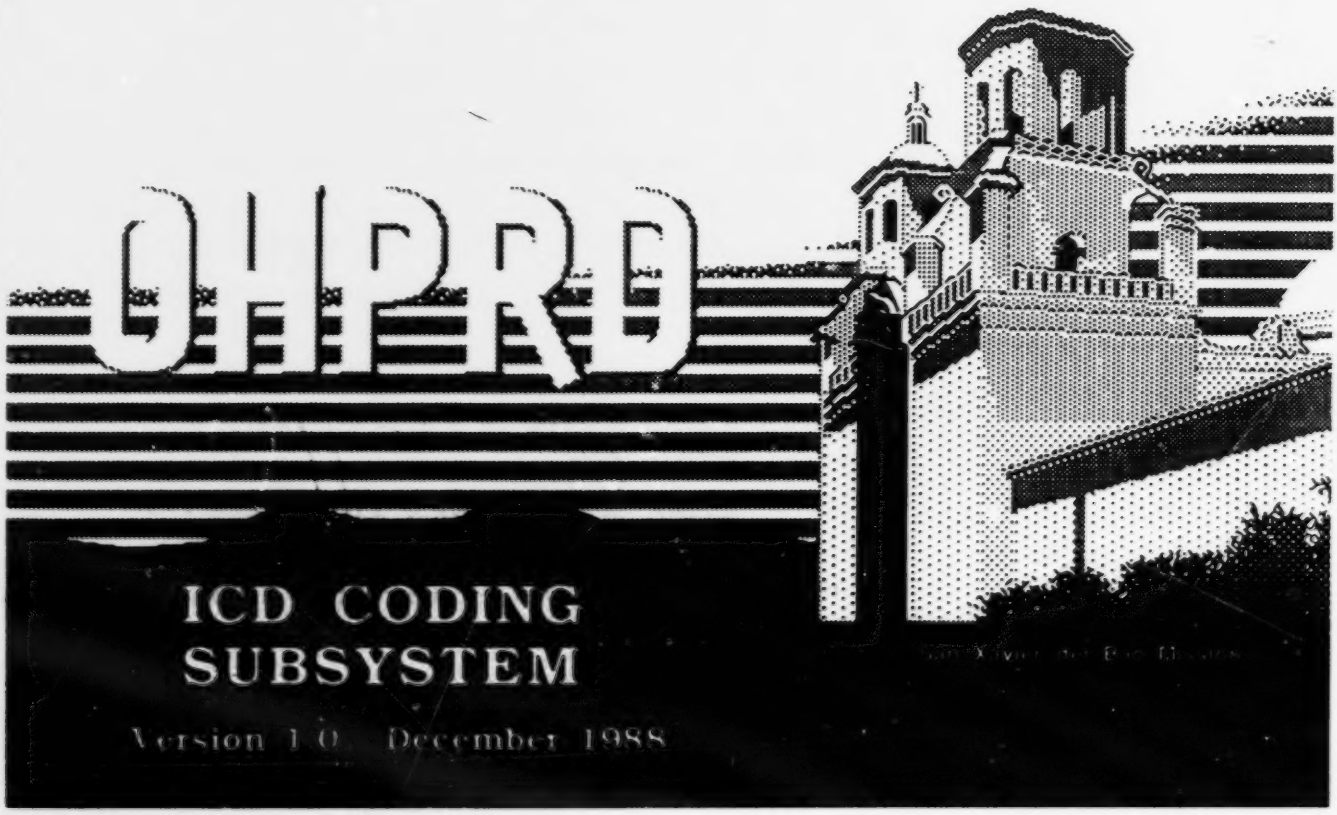
Version 1.0 - December 1988

best copy available

Indian Health Service

Office of Health Program Research & Development

Information Systems Division
7900 So. J. J. Stock Road
Tucson, Arizona 85746-9352



ICD CODING SUBSYSTEM

This manual provides a complete description of ICD Coding Subsystem, Version 1.0, December 1988

The complete set of PCC manuals is listed below:

- PCC Flier
- PCC Overview
- PCC Forms
- Health Summary
- Building a Health Summary
- Uses of the Health Summary (not currently available)
- PCC Reports
- Patient Register System
- Data Entry
- Data Transmission
- ICD Coding Subsystem
- Table Maintenance (not currently available)
- Forms Control (not currently available)
- Linkage to Other RPMS Components (not currently available)
- RPMS General Operating Instructions (not currently available)

The manuals may be obtained from the

Information Systems Division
Office of Health Program Research and Development
Indian Health Service
7900 South J. J. Stock Road
Tucson, AZ 85746-9352

Patient Care Component

User's Guide to the ICD Coding Subsystem

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PREFACE

PATIENT CARE COMPONENT
of the
RESOURCE and PATIENT MANAGEMENT SYSTEM

The Resource and Patient Management System (RPMS) of the Indian Health Service (IHS) is an integrated group of automated data systems designed to operate on mini-computers located in any IHS or tribal health facility (i.e., hospital or full-time clinic). The system will also link health facilities to each other and to administrative units such as Area Offices. The primary objective is to integrate patient care and cost data in a single automated data processing system that collects and stores a core set of health and management data that cuts across disciplines and facilities. A typical RPMS configuration in a health facility might include these systems: Patient Registration, Pharmacy, Dental, Maternal and Child Health, Contract Health Services, Laboratory, and the Patient Care Component (PCC). This manual has been designed to accompany the **Patient Care Component**.

The PCC provides for the collection and storage, on local RPMS computers, of a broad range of health data resulting from inpatient, outpatient, and field visits at IHS, tribal, contract, and community sites. It is designed to support health care delivery, planning, management, and research. For health professionals, the PCC is a tool that assists in providing the type of care that addresses all of a patient's known health problems and preventive health needs. Planners use information such as the numbers of various types of visits and the reasons for these visits. Managers use aggregate information such as numbers of patients who have insurance and the types of insurance. Researchers use the information for a variety of locally designed projects. PCC data types include date, type, and location of visit; providers of service; measurements; diagnoses and procedures; health problems and treatment plans; personal and family history; reproductive factors; laboratory test results; and a variety of other health-related information. As do other RPMS components, the PCC utilizes the File Manager database management system for data storage.

KEY FEATURES of the PCC

Integrated Data Files

The PCC integrates data from multiple provider groups (e.g., clinicians, community health nurses, community health representatives) into a common set of files that link all data to a patient. It also features direct linkage with the RPMS Pharmacy, Maternal and Child Health, Laboratory, Inpatient Admission/Discharge/Transfer (ADT), and Dental Modules. As these modules capture data to support their department-specific operations, selected items are automatically passed into appropriate files for permanent storage and use by PCC programs. Ultimately, a patient's health information from multiple facilities will be integrated in the PCC database at each site where the patient has an active medical record.

Encounter Forms

The multipurpose Ambulatory Encounter Record is the principal vehicle for entering data into the system. Its use reduces duplicate reporting and ensures accurate information in the PCC as well as the IHS national data systems. These multipart, carbonless forms are used for most ambulatory provider-patient encounters. The original is placed in the patient's chart or family folder and copies are used for appointment slips, patient instructions, excuses from school or work, referrals to other providers, and for entry of data into the PCC. Use of these ambulatory forms replaces use of the Ambulatory Patient Care (APC) form by IHS providers. In addition to the Ambulatory Encounter Record, alternate forms are available to meet specific requirements. These include the Well Child Exam Record, Adult History and Physical Examination Record, Emergency Visit Record, Inpatient Supplement and Discharge Follow-Up Record, and the Multi-Visit Encounter Record.

Data Entry Module

A data entry module is included that features English language data entry from PCC encounter forms with automated coding of the data, where necessary, into IHS Standard Codes. For diagnoses and procedures, a computer-assisted coding module encodes all commonly used terms into the International Classification of Diseases (ICD9-CM) and, for more complex terms, searches all ICD narratives and offers choices of potentially correct codes to the data entry operator. Both the provider's narrative and the appropriate ICD9-CM codes are stored for all diagnoses, procedures, problems and treatment plans. The provider's narrative is used, however, for PCC output such as the Health Summary.

Health Summary

A principal output of the PCC is the Health Summary, which provides a structured and summarized overview of each patient's health history together with a problem list, laboratory test results, and most recent medications. A printed Health Summary is produced routinely whenever a patient is seen by a provider and is updated through the encounter forms. The Health Summary and the Ambulatory Encounter Record are used together to create and maintain a patient's active and inactive health problem list. Together they assist the provider in building a comprehensive plan for health care.

Local health care providers can easily design their own Health Summary formats using a menu-driven Health Summary Development Module. Providers may choose from among a variety of Health Summary components to develop customized clinic-specific or problem-specific summaries. The PCC is delivered to Service Units with four standard Health Summary formats: Adult Regular, Pediatric, Dental, and Immunization.

Registers

The PCC includes a menu-driven module that facilitates the establishment of rudimentary patient registers for user-selected categories such as diabetic patients, crippled children, high risk pregnancies, or patients with unmet surgical needs. With the Register Module, a user can enter patients into a register, update selected items to be monitored (last visit, next visit, risk factors), and print a list of patients on a given register.

Report Generation

A set of reports is included that allows users to select a report from a menu. Frequently used reports include discharge listings, medication listings, third party data, and patients with a specific diagnosis.

Data Transmission

A set of programs is included that extracts recent inpatient and ambulatory visit data and transmits the data to the IHS Data Center in Albuquerque for inclusion in the IHS Inpatient and APC Data Systems.

On-Line Help Screens

In addition to providing operator and user manuals to accompany the PCC, the system contains numerous on-line Help Screens. The Help Screens briefly describe each menu option and are easy to access using question marks and keyword selections. Often a Help Screen is linked to additional screens that provide more detailed explanations.

Diagnosis Related Grouper

To assist in the collection of Medicare and Medicaid funds, and in the estimation of contract health care charges, a Diagnosis Related Grouper program is included that accepts the entry of diagnoses and procedures. It returns to the user a Diagnosis Related Group (DRG) value together with the IHS Weight and Average Length of Stay associated with that DRG. If multiple diagnoses and procedures are entered, the system will return all possible DRGs and their weights as if each diagnosis had been considered as the principal diagnosis. The DRG Grouper is linked to the Data Entry Module above; thus it permits entry of diagnoses and procedures in narrative terms or by ICD codes.

This manual provides a complete description of ICD Coding Subsystem, Version 1.0 - December 1988

ICD CODING SUBSYSTEM

1. Introduction

Many aspects of medical information systems hinge upon the standardized encoding of diagnoses or procedures for reporting, retrospective searches and statistics, etc. The applications of both the Veterans Administration's Distributed Hospital Computer Program (DHCP) and the Indian Health Service's Resource and Patient Management System (RPMS) depend heavily upon reference files containing the diagnosis and procedure codes of the International Classification of Diseases - 9th Edition - Clinical Modifications (ICD9-CM). Such applications include admission/discharge/ transfer (e.g., for admitting and discharge diagnoses), third-party billing (purpose of visit codes), and the Patient Care Component (e.g, problems, past medical history, etc.).

The most critical files (although others are involved) are the ICD DIAGNOSIS and ICD OPERATIONS/PROCEDURES files (see Appendix A). These were developed by the VA, which has historically maintained them as well. IHS has increased the functionality of the ICD files by augmenting the keywords that describe each entry and enhancing the method of looking up codes to accommodate the use of free text. This required the addition of a small number of fields to the ICD files (see Appendix B).

Diagnosis and procedure codes are selected from the ICD reference files using a lookup program that finds entries based on the words, independent of order or punctuation, contained in diagnostic or procedure narrative. Keywords in the ICD file that are partially matched by words in the input narrative are considered as synonyms, so that even abbreviated keywords can often make a contribution to the search.

The ICD subsystem of the PCC provides the user with the enhanced lookup and with the tools necessary to maintain the ICD files. This document describes both the lookup and the tasks involved in code maintenance. Efficient and effective use of the ICD lookup is essential to the PCC data entry process, and data entry users must be familiar with it. PCC managers must, in addition, become acquainted with maintenance of both the ICD files and the files that control the lookup process.

To assist in the training of data entry operators and medical records staff in analysis and entry of provider narrative, options for lookup of ICD diagnosis or procedure codes are provided for general use; these are non-destructive and may be distributed and used freely. In addition, the PCC manager at a site has access to a more complete set of tools for managing the ICD files. These include:

- ☆ Addition of keywords to entries for selected code(s)
- ☆ Addition or modification of shortcuts for frequently used narratives
- ☆ Printout of shortcuts for frequently used narratives, in alphabetic or ICD code order
- ☆ Addition or modification of synonyms for narrative terms
- ☆ Printout of synonym lists
- ☆ Creation or modification of entries in the ICD diagnosis or operations / procedures file
- ☆ Printout of the code files in code order
- ☆ Inactivation/reactivation of codes

References to menu options will occur frequently in the following sections of this document. Although options may be assigned to users on an as-needed basis, the general context for discussion of options will be the menu "Utilities for Auto-Coding System", which is accessed from the "PCC Manager Menu" option. The structure of the autocoding utilities menu is provided here for reference:

```
1     ICD-9 Dx Lookup
2     ICD-9 Procedure Lookup
3     Add Keywords to Dx File
4     Add keywords to Procedure File
5     Print Freq. Dx/Procedures - Alpha Order
6     Print Freq. Dx/Procedures - ICD Code Order
7     Add/Modify Frequently Used Diagnoses
8     Add/Modify Frequently Used Procedures
9     Add/Modify Diagnosis Synonyms
10    Add/Modify Procedure Synonyms
11    Print Synonym List
12    Create/Modify ICD Diagnosis File Entry
13    Create/Modify ICD Operations/Procedures File Entry
14    Print ICD Diagnosis File in Code Order
15    Print ICD Operations/Procedures File in Code Order
16    ICD Diagnosis Code Inactivation/Reactivation
17    ICD Procedure Code Inactivation/Reactivation
```

2. Basic Concepts

Two files contain ICD codes and associated items of information: ICD DIAGNOSIS and ICD OPERATION/PROCEDURE; each contains only the types of codes indicated by its name. Any RPMS application that deals with diagnoses or procedures references the appropriate file, and files that contain fields storing diagnoses or procedures "point" to entries in the ICD files.

The process of locating a desired entry entails interaction between the user and either a utility (such as the File Manager) or an application (such as Admission/Discharge/Transfer or PCC data entry): the user supplies either an ICD code or a narrative, and the lookup program is invoked by the application to locate any entries that match the user's input (or an indication that no such entries could be found). In the event that more than one entry is located, the user is given an opportunity to select the one desired.

Subject to Service Unit or Area policy, the lookup process may be customized on a local basis in any of the following ways:

1. Adding shortcut phrases (see Section 4) to the keyword lookup control file. This permits the immediate recognition and conversion to ICD code of selected narratives that occur with notable frequency.

2. Adding additional keywords (Section 5) to selected entries in the appropriate ICD file itself. This expands the set of terms that can be used in looking up a given ICD code.

3. Adding synonyms (Section 6) to the keyword lookup control file. This permits the conversion of slang or jargon into the vocabulary used in the official ICD narrative, thus enabling the lookup to deal with relatively informal narratives.

Each of these topics will be discussed in detail in the indicated section.

3. Enhanced ICD Lookup

The material that follows describes the ways in which lookups may be performed on the ICD diagnosis and procedure files. This applies whenever an application requests that the user make a selection from one of these files. For example, searches for discharge diagnosis in ADT, procedures in the DRG grouper, purpose of visit in the PCC, etc., all make use of the same lookup utility, and thus respond in a uniform and predictable manner.

The rules governing the processing of the input narrative are as follows:

1. Input that consists only of a string of characters that resembles a valid ICD code (including 'V' and 'E' codes) is looked up directly by the normal File Manager mechanism.

2. Narrative that, without further manipulation, exactly matches a "shortcut" phrase in the lookup control file (see Section 4) is recognized immediately and the corresponding ICD code is returned without further processing or searching.

3. The input is reduced to a set of words by applying the following transforms:

   a. Hyphens are removed from words consisting only of segments of fewer than three letters separated by hyphens (e.g., G-6-PD is reduced to G6PD, but X-RAY is not reduced).

   b. All punctuation is removed and replaced by blanks.

   c. Words that consist only of digits (i.e., that are numbers) are removed.

   d. A selected list of noise words is removed (AND, OR, OF, etc.), as are all two-character words. One-character words have been left in to maintain the meaning of phrases such as VITAMIN A, etc.

4. For each word remaining after step 3, the lookup control file is searched for synonyms (see Section 6). Any found are added to the word list and are treated as equivalent to the words for which they are synonyms.

5. Words that do not appear in any entry in the file are discarded.

6. For each word remaining after step 5 that is not preceded by a tilde ("~"), all keywords are retrieved for which the input word is a partial match (e.g., ALLERG in the input would cause retrieval of ALLERGIC, ALLERGY, etc.). These words are treated as synonyms for the original.

7. Finally, the file is searched for entries that contain all of the words (taking synonyms into account) in the list.

A variety of examples are given below. They employ primarily the ICD diagnosis file for simplicity, but lookups on the procedure file are done in exactly the same manner. Text entered by the user is shown in **BOLDFACE TYPE**, and **[RETURN]** is used to represent pressing the RETURN key.

A. Complete specification of ICD code:

When a complete ICD code is entered, including leading or trailing zeros, lookup is performed by File Manager in the normal manner, with echoing of identifiers.

```
NARRATIVE: 250.00    [RETURN] 250.00          DIABETES UNCOMPL ADULT/NIDDM
           OK? YES//  [RETURN] (YES)
```

B. Partial (incomplete) specification of ICD code:

If an incomplete ICD code is entered, the user will be given an opportunity to select the one desired from the set of codes beginning with the string entered.

```
NARRATIVE: 250    [RETURN]
      1   250   250.00          DIABETES UNCOMPL ADULT/NIDDM
      2   250.01    250.01          DIABETES UNCOMPL JUVEN/IDDM
      3   250.10    250.10          DIAB KETOACIDOSIS ADULT/NIDDM
      4   250.11    250.11          DIAB KETOACIDOSIS JUVEN/IDDM
      5   250.20    250.20          DIAB HYPEROSM COMA ADULT/NIDDM
TYPE '^' TO STOP, OR CHOOSE 1-5// 1     [RETURN]  250.00
```

C. Simple narrative specification:

The term used in this example is a frequently used narrative that has been entered in the shortcut portion of the keyword lookup control file, and is thus recognized immediately and encoded directly without further searching.

```
NARRATIVE: DIABETES

250.00 (DIABETES UNCOMPL ADULT/NIDDM)
ADULT-ONSET TYPE DIABETES MELLITUS WITHOUT MENTION OF COMPLICATION
/NONINSULIN DEPENDENT
OK? Y//  [RETURN]
```

D. Another example of shortcut lookup:

```
NARRATIVE: DIABETES MELLITUS

250.00 (DIABETES UNCOMPL ADULT/NIDDM)
ADULT-ONSET TYPE DIABETES MELLITUS WITHOUT MENTION OF COMPLICATION
/NONINSULIN DEPENDENT
OK? Y// [RETURN]
```

E. Multi-term narrative specification:

The input is transformed into a series of words, synonyms are located, and the file is searched. A number of candidates are found (ten, as indicated by the prompt), and the user is asked to select one, viewing five at a time.

```
NARRATIVE: ADULT DIABETES [RETURN]
( ADULT DIABETES/DIABETIC )

The following matches were found:

  1:  250.00 (DIABETES UNCOMPL ADULT/NIDDM)
        ADULT-ONSET TYPE DIABETES MELLITUS WITHOUT MENTION OF
        COMPLICATION /NONINSULIN DEPENDENT

...

  5:  250.40 (DIAB RENAL MANIF ADULT/NIDDM)
        ADULT-ONSET TYPE DIABETES MELLITUS WITH RENAL MANIFESTATIONS
        /NONINSULIN DEPENDENT

Select 1-10: 1 [RETURN]
```

Although the narrative used in this example resembles that of the previous one, they are in fact different: the presence of an extra space between DIABETES and MELLITUS prevented the shortcut from being taken, leading to a full keyword search and user selection from among a set of alternatives.

```
NARRATIVE: DIABETES  MELLITUS
( DIABETES/DIABETIC MELLITUS )
.....

The following matches were found:

  1:  250.00 (DIABETES UNCOMPL ADULT/NIDDM)
      ADULT-ONSET TYPE DIABETES MELLITUS WITHOUT MENTION OF
      COMPLICATION /NONINSULIN DEPENDENT
. . .

  5:  250.40 (DIAB RENAL MANIF ADULT/NIDDM)
      ADULT-ONSET TYPE DIABETES MELLITUS WITH RENAL MANIFESTATIONS
      /NONINSULIN DEPENDENT

Select 1-10: 1  [RETURN]
```

F. Complex narrative search with partial match expansion:

Note that the text fragments "DIAB" and "MEL" partially match a number of words used in the ICD file and are expanded to include them, as synonyms for the original text, in the search.

```
NARRATIVE: DIAB MEL,ADULT  [RETURN]
( ADULT DIAB/DIABETES/DIABETIC
MEL/MELANCHOLIA/MELANOCARCINOMA/MELANODERMA/MELANODONTIA/
MELANOMA/MELANOPLAKIA/MELANURIA/MELENA/MELIOIDOSIS/MELITENSIS/
MELKERSSONS/MELLITUS/MELTING )


The following matches were found:

  1:  250.00 (DIABETES UNCOMPL ADULT/NIDDM)
      ADULT-ONSET TYPE DIABETES MELLITUS WITHOUT MENTION OF
      COMPLICATION/NONINSULIN DEPENDENT

...

  5:  250.40 (DIAB RENAL MANIF ADULT/NIDDM)
      ADULT-ONSET TYPE DIABETES MELLITUS WITH RENAL MANIFESTATIONS
      /NONINSULIN DEPENDENT

Select 1-10: 1  [RETURN]
```

G. Lookup on procedure file:

Note the expansion of the fragment "ARTHRO".

```
NARRATIVE: ARTHRO,KNEE      [RETURN]

ARTHRO/ARTHROCENTESIS/ARTHRODESIS/ARTHROGRAM/ARTHROPLASTY
/ARTHROPOD/ARTHROSCOPY/ARTHROTOMY KNEE )
....
The following matches were found:

  1:  80.06 (ARTHROT/PROS REMOV-KNEE)
        ARTHROTOMY FOR REMOVAL OF PROSTHESIS OF KNEE
. . .
  4:  81.22 (ARTHRODESIS OF KNEE)
        ARTHRODESIS OF KNEE
. . .
Select 1-4: 1  [RETURN]
```

H. Alternative form of procedure lookup:

This example illustrates the independence of the search from the presence of punctuation and the order of words.

NARRATIVE: **KNEE ARTHRO. [RETURN]**

(ARTHRO/ARTHROCENTESIS/ARTHRODESIS/ARTHROGRAM/ARTHROPLASTY
/ARTHROPOD/ARTHROSCOPY/ARTHROTOMY KNEE)

The following matches were found:

1: 80.06 (ARTHROT/PROS REMOV-KNEE)
ARTHROTOMY FOR REMOVAL OF PROSTHESIS OF KNEE

. . . .

4: 81.22 (ARTHRODESIS OF KNEE)
ARTHRODESIS OF KNEE

Select 1-4: **1 [RETURN]**

The following examples are presented to demonstrate the effect of alternative phrasings of the same diagnosis on the lookup. The first one illustrates the discarding of a term ("AND") that appears in the lookup's list of "noise" words:

```
NARRATIVE: JUVENILE DIABETES AND COMA
( COMA/COMATOSE DIABETES/DIABETIC JUVENILE )

The following word was not used in this search:
AND
. .
The following matches were found:

  1:  250.21 (DIAB HYPEROSM COMA JUVEN/IDDM)
        JUVENILE TYPE DIABETES MELLITUS WITH HYPEROSMOLAR COMA/INSULIN
        DEPENDENT

  2:  250.31 (DIABETES COMA NEC JUVEN/IDDM)
        JUVENILE TYPE DIABETES MELLITUS WITH OTHER COMA/INSULIN
        DEPENDENT


Select 1-2:  1    [RETURN]
```

The next case illustrates the effect of abbreviation and the insensitivity of the lookup to word order or punctuation:

```
NARRATIVE: DIABETES,JUV., WITH COMA
( COMA/COMATOSE DIABETES/DIABETIC JUV/JUVENILE/JUVENILIS )

The following word was not used in this search:
WITH

The following matches were found:

  1:  250.21 (DIAB HYPEROSM COMA JUVEN/IDDM)
      JUVENILE TYPE DIABETES MELLITUS WITH HYPEROSMOLAR COMA/INSULIN
      DEPENDENT

  2:  250.31 (DIABETES COMA NEC JUVEN/IDDM)
      JUVENILE TYPE DIABETES MELLITUS WITH OTHER COMA/INSULIN
      DEPENDENT

Select 1-2:  1  [RETURN]
```

In the next case, the lookup is unsuccessful because the words "SECONDARY" and "TO" appear in some ICD entries, but **not** in the ones of interest, and the entries retrieved previously are disqualified because they do not contain **all** of the specified keywords:

```
NARRATIVE: COMA SECONDARY TO JUVENILE DIABETES
( COMA/COMATOSE DIABETES/DIABETIC JUVENILE SECONDARY TO )
Search was unsuccessful
```

On the other hand, an extremely similar phrasing may succeed:

```
NARRATIVE: COMA FROM JUVENILE DIABETES
( COMA/COMATOSE DIABETES/DIABETIC JUVENILE )

The following word was not used in this search:
FROM

The following matches were found:

  1:  250.21 (DIAB HYPEROSM COMA JUVEN/IDDM)
        JUVENILE TYPE DIABETES MELLITUS WITH HYPEROSMOLAR COMA
        /INSULIN DEPENDENT

  2:  250.31 (DIABETES COMA NEC JUVEN/IDDM)
        JUVENILE TYPE DIABETES MELLITUS WITH OTHER COMA/INSULIN
        DEPENDENT

Select 1-2: 1  [RETURN]
```

Taken step by step, the logic behind the lookup of the first example in the last set is as follows:

NARRATIVE: **JUVENILE DIABETES AND COMA**

(A) No shortcut exists, so keyword-driven lookup must take place.

(B) Conversion of input text to words (including removal of punctuation) leaves:

COMA
DIABETES
JUVENILE

The word "AND" is interpreted as a noise word, and is discarded.

(C) Search for synonyms locates two (DIABETES and DIABETIC) for "DIABETES":

DIABETES = DIABETES | DIABETIC

(D) Search for partial matches results in expansion of COMA (the strings DIABETES and JUVENILE do not begin any terms other than themselves):

COMA = COMA / COMATOSE

(E) "AND"ing search logic is thus:

(COMA or COMATOSE) and (DIABETES or DIABETIC) and (JUVENILE)

The lookup program informs the user of the terms being used in the lookup, separating expansions with the symbol "/" and synonyms with "|":

(COMA/COMATOSE DIABETES|DIABETIC JUVENILE)

As shown in the example, two entries are found that meet these criteria.

4. Adding Shortcut Phrases

As discussed in Section 3, "shortcuts" are a mechanism for rapidly recognizing, and converting into codes, selected narratives that occur with such frequency that treating them specially yields significant gains in data entry speed or general user productivity. Input narrative is searched for in the shortcut file including punctuation, spacing, etc., as the first step in the lookup process. If found, the associated code is returned immediately without further processing.

Since local patterns of practice, purposes of visits, problems, etc., will determine what is a high-frequency narrative, a mechanism is provided to create shortcuts for both diagnosis and procedure narrative. For a diagnosis narrative, the user selects the "Add/Modify Frequently Used Diagnoses" option, leading to dialog similar to the following:

```
Select FREQUENTLY USED NARRATIVE: CHEST COLD    [RETURN]
  CODE FOR PHRASE: 460.  [RETURN]
```

If a shortcut is to be added whose text is an initial substring of one or more terms already in the control file, it is necessary to enclose the shortcut in double quotes to prevent File Manager from attempting to match the existing terms as shown:

```
Select FREQUENTLY USED NARRATIVE: URI   [RETURN]
        1    URINARY TRACT INFECTION
        2    URINATION DIFFICULTY
CHOOSE 1-2:  [RETURN]
Select FREQUENTLY USED NARRATIVE: "URI"   [RETURN]
  CODE FOR PHRASE: 465.9  [RETURN]
```

To delete a shortcut, the user selects a frequently used narrative, then responds with an "at" (@) symbol when prompted for a change:

```
Select FREQUENTLY USED NARRATIVE: CHEST COLD   [RETURN]
FREQUENTLY USED NARRATIVE: CHEST COLD//@    [RETURN]
SURE YOU WANT TO DELETE THE ENTIRE 'CHEST COLD' FREQUENTLY USED
NARRATIVE? Y  (YES)
```

The process is exactly the same for managing shortcut phrases for the procedure file, except that the option used is "Add/Modify Frequently Used Procedures".

Because it may occasionally be helpful to obtain a printed copy of the shortcuts in effect at a facility, options are available to generate listings in code ("Print Freq. Dx/Procedures - ICD Code Order") and alphabetic ("Print Freq. Dx/Procedures - Alpha Order") sequence. Sample extracts of the reports generated are shown in the next two pages. Note that each option prints shortcuts created for both diagnosis and procedure codes.

A. Print Freq. Dx/Procedures - Alpha Order

KEYWORD LOOKUP CONTROL LIST - - ALPHA ORDER DEC 3,1987 22:07 PAGE 1

FREQUENTLY USED NARRATIVE	CODE
CATEGORY: DIAGNOSES	
ABD PAIN	789.0
ABDOMINAL PAIN	789.0
ABORT MED IND WITHOUT MENTION COMP	635.90
ACNE	706.1
...	
CATEGORY: PROCEDURES	
ABDOMINAL ULTRASOUND	88.76
ADENOIDECTOMY	28.6
AMNIOTOMY	73.09
ANTERIOR REPAIR	70.51
ANTIBIOTIC INJECTION	99.21
APPENDECTOMY	47.0
...	

B. Print Freq. Dx/Procedures - ICD Code Order

KEYWORD LOOKUP CONTROL LIST - - ICD CODE ORDER DEC 3,1987 22:08 PAGE 1

FREQUENTLY USED NARRATIVE	CODE
CATEGORY: DIAGNOSES	
ONYCHOMYCOSIS	110.1
TINEA PEDIS	110.4
YEAST VAGINITIS	112.1
MONILIAL VAGINITIS	112.1
MONILIA VAGINITIS	112.1
MONILIA	112.9
MONILIAL	112.9
...	
CATEGORY: PROCEDURES	
CATARACT EXTRACTION	13.19
EXTRACAPSULAR CATARACT EXTRACTION	13.59
LEFT TYPE I TYMPANOPLASTY	19.4
R TYPE I TYMPANOPLASTY	19.4
L TYPE I TYMPANOPLASTY	19.4
BILATERAL MYRINGOTOMIES AND TUBES	20.01
BILATERAL MYRINGOTOMY AND TUBES	20.01

5. Adding Additional Keywords

As discussed in Section 3, additional keywords may be added to entries in the ICD files to enhance the user's ability to locate codes based on free text narrative. Such keywords will typically be terms commonly used to describe a clinical entity but which do not appear in the official text for the code of interest.

Local circumstances will determine what keywords are required (which may change over time). Thus, a mechanism is provided to add (and, if necessary, delete) keywords for both diagnosis and procedure files. For a diagnosis code, the user selects the "Add Keywords to Dx File" option, leading to dialog similar to that in the examples given below. The process of manipulating keywords for procedure codes is identical except that the user selects the option "Add Keywords to Procedure File".

A. Adding a keyword:

```
Code: 465.9  [RETURN]  ACUTE UPPER RESPIRATORY INFECTIONS OF
  UNSPECIFIED SITE
Keywords: ?  [RETURN]
Keywords: COLD  [RETURN]
Code: 465.9  [RETURN]  ACUTE UPPER RESPIRATORY INFECTIONS OF
  UNSPECIFIED SITE
Keywords: ?  [RETURN]
COLD
```

Notes:

a. Entering a question mark (**?**) in response to the prompt for keywords will cause all existing keywords for the code to be displayed in alphabetical order.

b. Keywords must be entered in uppercase (capital) letters.

B. Adding multiple keywords at one time:

Code: **465.9** **[RETURN]** ACUTE UPPER RESPIRATORY INFECTIONS OF UNSPECIFIED SITE
Keywords: **?** **[RETURN]**
COLD
Code: **465.9** **[RETURN]** ACUTE UPPER RESPIRATORY INFECTIONS OF UNSPECIFIED SITE
Keywords: **URI NOS VIRAL** **[RETURN]**
Code: **[SPACE BAR]** **[RETURN]** ACUTE UPPER RESPIRATORY INFECTIONS OF UNSPECIFIED SITE
Keywords: **?** **[RETURN]**
COLD
NOS
URI
VIRAL

Notes:

a. Entering a series of keywords separated by single spaces causes all of the given keywords to be added to the code being operated upon.

b. Entering a space when prompted for code will cause the last code entered, if valid, to be selected.

C. Deleting a keyword:

```
Code: 465.9  [RETURN]  ACUTE UPPER RESPIRATORY INFECTIONS OF
  UNSPECIFIED SITE
Keywords: ?  [RETURN]
COLD
NOS
URI
VIRAL
Keywords: @COLD  [RETURN]

Code: [SPACE BAR]  [RETURN]  ACUTE UPPER RESPIRATORY INFECTIONS OF
  UNSPECIFIED SITE
Keywords: ?  [RETURN]
NOS
URI
VIRAL
```

Note: Entering a keyword preceded by an "at" symbol (@) code will cause the keyword to be deleted for the code being operated upon.

D. Deleting multiple keywords at one time:

```
Code: 465.9  [RETURN]  ACUTE UPPER RESPIRATORY INFECTIONS OF
  UNSPECIFIED SITE
Keywords: ?  [RETURN]
NOS
URI
VIRAL
Keywords: @NOS @VIRAL   [RETURN]
..
Code: [SPACE BAR]  [RETURN]  ACUTE UPPER RESPIRATORY INFECTIONS OF
  UNSPECIFIED SITE
Keywords: ?  [RETURN]
URI
```

Note: In a fashion similar to the addition of keywords, entering a series of keywords, each preceded with an "at" sign (@) and separated by a single space, causes all of the given keywords to be deleted from the code being operated upon.

E. Attempting to add keywords to a non-existent code:

```
Code: 469.5  [RETURN]  - - Code does not exist and has no more specific descendents.
```

F. Exiting from the utility:

```
Code:  [RETURN]

B y e . . .
```

Note: Entering a **[RETURN]** at the prompt for code causes the utility to terminate.

6. Adding Synonyms

Synonyms support three approaches to reconciling the language used in day to day provider narrative with that of the official ICD texts:

A. Conversion of terms or abbreviations that appear in narrative text but not in the ICD files into keywords usable for lookup on the official text. For example, the common abbreviation "FX" does not appear in the ICD text, but the word "FRACTURE" does.

B. Collapsing of terms that appear in narrative text into root words or stems that can be expanded into terms appearing in the ICD files that can be used in the lookup process. For example, the terms "ALLERGY", "ALLERGIES", and "ALLERGIC" might all be synonymed to the stem "ALLERG" in order to cause all terms in the ICD file beginning with that stem to be considered as synonyms for the original words when they appear in provider narrative.

C. Establishing equivalency, for purposes of lookup, between words that may appear in different forms in the ICD files. For example, "CANCER" might be synonymed to both "CANCER" and "MALIG" to allow input of the term "CANCER" to match all entries containing either "CANCER" or any word beginning with "MALIG".

It is important to note that the synonym replaces the original word, so that if (as in the last example above) the original term is to be retained in the search, it must be synonymed to itself as well as its other synonyms.

In order to add a synonym to be used in looking up diagnosis codes, the user selects the option "Add/Modify Diagnosis Synonyms", then enters terms and synonyms for the terms as shown:

```
Select TERM: FX    [RETURN]
   ARE YOU ADDING 'FX' AS A NEW TERM (THE 359TH FOR THIS KEYWORD
LOOKUP CONTROL)? Y  [RETURN]  (YES)
   Select SYNONYM FOR TERM: FRACTURE    [RETURN]
   Select SYNONYM FOR TERM:
```

To delete a synonym, the user selects

```
Select TERM: HUMERAL   [RETURN]
  TERM: HUMERAL// @   [RETURN]
   SURE YOU WANT TO DELETE THE ENTIRE 'HUMERAL' TERM? Y   [RETURN]  (YES)
```

Management of procedure codes is exactly the same except that the user selects the option "Add/Modify Procedure Synonyms". To further illustrate the effect on the lookup process, assume that the following synonyms have been established:

ALLERGIC	=	ALLERG
ALLERGIES	=	ALLERG
ALLERGY	=	ALLERG

A. Lookup of term for which a shortcut exists:

Note that shortcuts are looked for before synonym processing is carried out. Thus "ALLERGIES" is recognized directly.

```
NARRATIVE: ALLERGIES   [RETURN]
995.3 (ALLERGY, UNSPECIFIED)
ALLERGY, UNSPECIFIED, NOT ELSEWHERE CLASSIFIED
```

B. Participation of synonymed term in keyword lookup:

In this case a synonym for "ALLERGIES" is found ("ALLERG") and then expanded to all terms beginning with that stem:

```
NARRATIVE: POLLEN ALLERGIES
(ALLERG/ALLERGEN/ ALLERGENS/ALLERGIC/ALLERGIES/ALLERGY POLLEN
/POLLENOSIS)

477.0 (RHINITIS DUE TO POLLEN)
ALLERGIC RHINITIS DUE TO POLLEN
```

In this similar example the synonym for "ALLERGIC" is found and the synonym "ALLERG" is again expanded to all terms beginning with that stem:

NARRATIVE: **ALLERGIC**

(ALLERG/ALLERGEN/ALLERGENS/ALLERGIC/ALLERGIES/ALLERGY)

.....

The following matches were found:

1: 288.3 (EOSINOPHILIA)
EOSINOPHILIA

2: 364.04 (SECOND IRITIS, NONINFEC)
SECONDARY IRIDOCYCLITIS, NONINFECTIOUS

3: 372.14 (CHR ALLRG CONJUNCTIV NEC)
OTHER CHRONIC ALLERGIC CONJUNCTIVITIS

4: 373.32 (CONTACT DERMATIT EYELID)
CONTACT AND ALLERGIC DERMATITIS OF EYELID

5: 381.04 (AC ALLERGIC SEROUS OM)
ACUTE ALLERGIC SEROUS OTITIS MEDIA

Select 1-69:

As with shortcuts, an option ("Print Synonym List") is provided for generating a listing of the synonyms that have been defined. A sample extract of this report appears below:

SYNONYM LIST MAY 27,1988 12:46 PAGE 1

TERM	SYNONYM FOR TERM
NAME:	DIAGNOSES
ABANDONED	ABANDON
ABANDONING	ABANDON
ABANDONMENT	ABANDON
ABDOMEN	ABDOM
ABDOMINAL	ABDOM
ABNORMALITIES	ABNORMAL
ABNORMALITY	ABNORMAL
ABSCESS	ABSCESS
	CELLULITIS
ABUSED	ABUSE
ACCELERATED	ACCELERAT
ACCELERATION	ACCELERAT
ACTINOMYCOSIS	ACTINOMYCO
ACTINOMYCOTIC	ACTINOMYCO
ADACTYLIA	ADACTY
ADACTYLY	ADACTY
ADENITIS	ADENITIS
	LYMPHADENITIS
ADENOCARCINOMA	NEOPLASM
	MALIG
	CANCER
...	
CATEGORY:	PROCEDURES
ABDOMEN	ABDOMEN
ABDOMINAL	
ABDOMINAL	ABDOMINAL
ABDOMEN	
DISSECTION	DISSECTION
	EXCISION
EXCISION	EXCISION
	DISSECTION
MAMMOGRAM	MAMMOGRA
MAMMOGRAPHY	MAMMOGRA
TOMOGRAM	TOMOGRA
TOMOGRAPHY	TOMOGRA
TUBES	TUBE
VENTRICLE	VENTRICLE
	VENTRICULAR
...	

7. Controlling the Activity Status of Codes

In general, all ICD codes in both the diagnosis and procedure files are active codes potentially selectable by a user. The exceptions are codes that are obsolete, incorrect, or represent extensions beyond the official ICD definitions; many will have been noted in the official WHO Errata. These are marked as inactive, and applications that reference the ICD files are responsible for screening out these codes when asking the user to make a selection.

As distributed, only codes that are invalid for the IHS as a whole are marked as inactive. Should an individual code that is currently active need to be inactivated at some time in the future, the PCC manager should use File Manager to alter the INACTIVE CODE field; it should not be necessary under ordinary circumstances to alter the status of codes in a mass fashion. The following demonstrates the process of inactivating or reactivating a given code:

(assuming the user is in File Manager)
(first, inactivation by setting the inactivation flag)

```
Select VA FileMan Option: 1   [RETURN]  Enter or Edit File Entries

INPUT TO WHAT FILE: ICD DIAGNOSIS   [RETURN]        (12399 entries)
EDIT WHICH FIELD: ALL// INACTIVE FLAG   [RETURN]
THEN EDIT FIELD: [RETURN]

Select ICD DIAGNOSIS CODE NUMBER: 086.0   [RETURN]  086.0 CHAGAS
DISEASE OF HEART
              ...OK? YES// [RETURN]   (YES)

INACTIVE FLAG: ?   [RETURN]
   INACTIVE CODES CAN NO LONGER BE SELECTED FOR DIAGNOSIS
   CHOOSE FROM:
         I          INACTIVE CODE
INACTIVE FLAG: 1   [RETURN]  INACTIVE CODE
```

(now, reactivation by deleting the inactivation flag)

```
Select ICD DIAGNOSIS CODE NUMBER: 086.0   [RETURN]  086.0 CHAGAS
DISEASE OF HEART
  ...OK? YES//   [RETURN]   (YES)
INACTIVE FLAG: INACTIVE CODE// @   [RETURN]
   SURE YOU WANT TO DELETE? Y   [RETURN] (YES)
```

In rare instances, it may be appropriate to inactivate multiple codes. **This should NOT ordinarily be done in the field.** For example, a facility that saw **only** male patients might inactivate all diagnoses that could only apply to females in order to reduce the number of choices a user or data entry operator might have to consider.

Two files (ICD DX INACTIVATION CONTROL FILE and ICD OP INACTIVATION CONTROL FILE) are used to store a record of which diagnosis and procedure codes should be inactive. Utilities are provided on the "Utilities for Auto-Coding System" menu, accessible only through the PCC MANAGER menu, which will initially activate **all** codes, then selectively inactivate the codes noted in the pertinent control file. These options are "ICD Diagnosis Code Inactivation/ Reactivation" and "ICD Procedure Code Inactivation/Reactivation". Note that File Manager must still be used to insert the codes to be inactivated into the control files. For convenience, a trigger has been established on the control files that causes the inactive flag for the code in the corresponding ICD dictionary to be set whenever an entry is added to the control file.

The following example illustrates the process, which is non-interactive. After selecting "ICD Diagnosis Code Inactivation/ Reactivation" the user sees:

```
Resetting flags:
(computer will display internal entry numbers to indicate progress)
Setting flags of codes to be inactivated:
(computer will display internal entry numbers to indicate progress)

DONE!
```

The process is identical for procedure codes, using the option "ICD Procedure Code Inactivation/Reactivation".

Appendix A: Structure of ICD Files

ICD DIAGNOSIS FILE (#80)

FIELD NUMBER	FIELD NAME
.01	CODE NUMBER (Free text)
2	IDENTIFIER (Free text)
3	DIAGNOSIS (Free text)
5	MAJOR DIAGNOSTIC CATEGORY (Pointer)
5.5	MDC13 (Numeric)
6	DRG (Multiple)
	.01 DRG (Pointer)
	1 TEST (Free text)
8	ICD EXPANDED (Set of codes)
9.5	USE ONLY WITH SEX (Set of codes)
10	DESCRIPTION (Free text)
20	ICD9 CODES NOT TO USE WITH (Multiple)
	.01 IGD9 CODES NOT TO USE WITH (Pointer)
30	ICD9 CODES REQUIRED WITH (Multiple)
	.01 ICD9 CODES REQUIRED WITH (Pointer)
100	INACTIVE FLAG (Set of codes)
101	NOT IN DXLS (Set of codes)
505	COMPLICATION (Set of codes)
500055	ANTIBIOTIC DIAGNOSIS? (Set of codes)
9999999.01	LOWER AGE (Numeric)
9999999.02	UPPER AGE (Numeric)
9999999.03	PRO PRE-AUTHORIZATION (Set of codes)
9999999.21	OTHER KEY WORDS (Multiple)
	.01 OTHER KEY WORDS (Free text)

Only the DESCRIPTION and OTHER KEYWORDS fields contribute directly to the lookup. An application may establish a screen using fields such as ICD EXPANDED, USE ONLY WITH SEX, INACTIVE FLAG, LOWER AGE, and UPPER AGE to prevent selection of codes inappropriate in a given context.

ICD OPERATION/PROCEDURE FILE (#80.1)

FIELD NUMBER	FIELD NAME
.01	CODE NUMBER (Free text)
2	IDENTIFIER (Free text)
4	OPERATION/PROCEDURE (Free text)
6	DRG (Multiple)
	.01 DRG (Pointer)
7	MDC (Multiple)
	.01 MDC (Pointer)
8	ICD EXPANDED (Set of codes)
9.5	USE ONLY WITH SEX (Set of codes)
10	DESCRIPTION (Free text)
20	ICDO CODES NOT TO USE WITH (Multiple)
	.01 ICDO CODES NOT TO USE WITH (Pointer)
30	ICDO CODES REQUIRED WITH THIS (Multiple)
	.01 ICDO CODES REQUIRED WITH THIS (Pointer)
50	OPERATION LENGTH (Numeric)
51	REQUESTED BLOOD KIND (Pointer)
52	NUMBER OF BLOOD UNITS (Numeric)
53	SCREEN OR TYPE (Set of codes)
54	ANESTHESIA RUG (Numeric)
55	ACS NAME (Free text)
100	INACTIVE FLAG (Set of codes)
500055	ANTIBIOTIC OPERATION? (Set of codes)

9999999.01 LOWER AGE (Numeric)
9999999.02 UPPER AGE (Numeric)
9999999.03 PRO-PRE AUTHORIZATION (Set of codes)
9999999.21 OTHER KEY WORDS (Multiple)
.01 OTHER KEY WORDS (Free text)

Only the DESCRIPTION and OTHER KEYWORDS fields contribute directly to the lookup. An application may establish a screen using fields such as ICD EXPANDED, USE ONLY WITH SEX, INACTIVE FLAG, LOWER AGE, and UPPER AGE to prevent selection of codes inappropriate in a given context.

Appendix B: IHS Modifications to VA Files

The following fields were added to the original VA dictionaries for the ICD files:

9999999.01 LOWER AGE (Numeric)
9999999.02 UPPER AGE (Numeric)
9999999.03 PRO-PRE AUTHORIZATION (Set of codes)
9999999.21 OTHER KEY WORDS (Multiple)

Only the last field enters directly into the lookup process (see Section 3 and Section 5).

Appendix C: Structure of Keyword Lookup Control File

KEYWORD LOOKUP CONTROL FILE (#9001010)

FIELD NUMBER	FIELD NAME	
.01	CATEGORY (Free text)	
1	SYNONYM DEFINITIONS (Multiple)	
	.01 TERM (Free text)	
	1 SYNONYMS (Multiple)	
	.01 SYNONYM FOR TERM (Free text)	
2	REPLACEMENT DEFINITIONS (Multiple)	***** NOT USED
	.01 REPLACED TEXT (Free text)	***** AT THIS
	1 REPLACEMENT (Free text)	***** TIME
3	SHORT CUT DEFINITIONS (Multiple)	
	.01 FREQUENTLY USED NARRATIVE (Free text)	
	1 CODE (Free text)	

Currently defined values for CATEGORY: DIAGNOSES and PROCEDURES
Sample of SYNONYM DEFINITIONS:

TERM: **FX**
SYNONYM FOR TERM: FRACTURE

Sample of SHORT CUT DEFINITIONS:

FREQUENTLY USED NARRATIVE: **DIABETES**
CODE: 250.00